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EFFECT OF VARIOUS RETAIL-STORE DISPLAY AND HANDLING PRACTICES ON THE QUALITY OF ELBERTA PEACHES

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EFFECT OF VARIOUS RETAIL-STORE DISPLAY AND HANDLING PRACTICES ON THE QUALITY OF ELBERTA PEACHES

Summary and Conclusions

Because refrigeration retards ripening and decay, peaches that have not yet reached a desirable stage of ripeness should be displayed without refrigeration. On the other hand, to keep them in the best condition possible and to permit some ripening, ripe peaches should either be displayed in mechanically refrigerated cases or be stored in "walk-in coolers" at night.

Greatest loss in weight occurred in peaches displayed continuously without refrigeration. No shriveling developed under any of the various handling practices, and only a small amount of bruising was found at the end of the 3-day tests.

Moisture condensation due to changes in temperature from refrigerated night storage to display room temperatures caused no appreciable deterioration. Sprinkling with tap water several times daily had no harmful effect, but no material advantage resulted from this practice.

Introduction

In 1953 and 1954, studies were made at Beltsville, Md., to determine the effects of various retail-store display and handling methods on the quality of Elberta peaches. The studies were conducted in a laboratory that was equipped with several types of display cases in which temperatures in retail stores could be simulated. Three different lots of peaches were used in the tests. They were obtained in original containers from the Washington, D. C., wholesale produce market. The containers were marked to indicate that the peaches were grown in Virginia and Pennsylvania.

Operation of the Display Room

The peaches were sorted into representative lots before they were arranged on the display racks. They were displayed about 7 inches deep from the front to the back of each rack. Approximately 75 peaches were used for each treatment. The peaches were displayed for 3 days, as follows:

1. In a nonrefrigerated case continuously. A 6-foot wooden display case with galvanized-metal bottom and sides was used. The case was provided with a slatted rack that sloped towards the front. The distance from the front to the back of the case was 30 inches.

2. In a nonrefrigerated case during the daytime and in 32° and 40° F. walk-in coolers at night. (Nonrefrigerated case was the same as the one

described under 1.) In the night storage rooms, temperatures were thermostatically controlled, and small fans were used to circulate the air. The relative humidity was approximately 85 percent.

3. In a 10-foot commercial, forced-air-circulation, mechanically refrigerated case continuously.

In each type of display case, one lot of peaches was sprinkled with tap water 4 times daily, and a duplicate lot was not sprinkled. However, the nonsprinkled peaches held overnight in the refrigerated storage rooms became wet from condensed moisture when they were returned to the nonrefrigerated rack each morning.

The display period began between 8 and 9 a.m. and ended between 6 and 7 p.m.

Temperatures of the produce on display were taken in the top and bottom layers at the front and back of the rack. Produce temperatures reported are averages for the four positions during the 3-day testing periods.

The relative humidities in the display room during the 3-day testing periods averaged 54, 55, and 57 percent.

Results

The development of decay, bruising, ripening, softening, shriveling, and weight loss were the quality factors studied during the tests. (See table 1.)

Peaches displayed continuously without refrigeration decayed more rapidly than those held continuously in a mechanically refrigerated case or displayed on a nonrefrigerated rack during the daytime and held overnight in walk-in coolers. At the end of 3 days, nonsprinkled and sprinkled peaches displayed continuously without refrigeration averaged 14 and 16 percent decay, respectively. Sprinkled peaches displayed without refrigeration during the daytime and held overnight in a room with the temperature at 32° F. averaged 6-percent decay, while those in the other lots averaged 3 percent or less. The decay was principally brown rot. Condensation of moisture on peaches moved from the "walk-in coolers" to display room temperatures (75° to 86° F.) had no appreciable effect on the development of decay.

Regardless of the method of handling, the peaches showed no shriveling at the end of the 3-day tests, and an average of 3 percent or less were bruised.

Nonsprinkled, nonrefrigerated peaches and sprinkled, nonrefrigerated peaches lost 9 and 7 percent, respectively, in weight; whereas refrigerated peaches and peaches stored in walk-in coolers lost 4 percent or less. Nonsprinkled peaches lost slightly more weight than the sprinkled ones under each of the handling practices.

Ripening and softening progressed more rapidly in peaches held continuously without refrigeration. Peaches displayed in the mechanically refrigerated case remained firm the longest. No marked differences in softening were found in peaches held overnight in the rooms having temperatures of 32° and 40° F.

Table 1. Description of Elberta peaches displayed for 3 days under various conditions to simulate retail-store displays

Treatment	Test month	Temperature		Pressure-test reading		Condition of fruit					Weight loss
		Display room	Produce	At start	After 3 days	Green	Turning ripe	Ripe	Decayed	Bruised	
		°F.	°F.	Lb.	Lb.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
No refrigeration:											
No sprinkling	July	86	78	9.2	1.2	0	48	52	5	0	10
	Aug.	85	80	6.8	1.2	7	62	31	17	3	7
	Sept.	75	68	4.6	1.3	0	4	96	20	6	10
	Av.	82	75	6.9	1.2	2	38	60	14	3	9
Sprinkling daily	July	86	76	9.2	1.4	0	70	30	3	0	5
	Aug.	85	78	6.8	1.3	5	63	32	22	2	6
	Sept.	75	66	4.6	1.0	0	8	92	24	4	9
	Av.	82	74	6.9	1.2	2	47	51	16	2	7
No refrigeration days and 32° F. refrigeration nights:											
No sprinkling	July	86	45	9.2	2.7	0	95	5	2	0	3
	Aug.	85	48	6.8	2.3	8	73	19	0	1	3
	Sept.	75	44	4.6	2.4	0	53	47	6	3	5
	Av.	82	46	6.9	2.5	3	74	23	3	1	4
Sprinkling daily	July	86	45	9.2	3.5	0	93	7	3	3	1
	Aug.	85	47	6.8	2.3	5	73	22	0	2	0
	Sept.	75	44	4.6	2.2	0	65	35	14	1	3
	Av.	82	45	6.9	2.7	2	77	21	6	2	1
No refrigeration days and 40° F. refrigeration nights:											
No sprinkling	July	86	50	9.2	3.3	0	90	10	3	3	3
	Aug.	85	53	6.8	2.6	3	76	21	0	3	3
	Sept.	75	49	4.6	2.1	0	35	65	7	3	5
	Av.	82	51	6.9	2.7	1	67	32	3	3	4
Sprinkling daily	July	86	50	9.2	3.6	0	92	8	0	0	0
	Aug.	85	53	6.8	2.1	7	72	21	0	1	1
	Sept.	75	49	4.6	2.4	1	63	36	0	1	3
	Av.	82	51	6.9	2.7	3	76	21	0	1	1
Constant mechanical refrigeration (forced-circulation):											
No sprinkling	July	86	46	9.2	7.8	0	90	10	0	0	5
	Aug.	85	43	6.8	5.3	8	77	15	0	1	3
	Sept.	75	43	4.6	4.6	0	70	30	4	1	4
	Av.	82	44	6.9	5.9	3	79	18	1	1	4
Sprinkling daily	July	86	47	9.2	7.8	0	93	7	0	0	3
	Aug.	85	43	6.8	5.0	14	70	16	0	1	2
	Sept.	75	42	4.6	4.1	2	68	30	6	1	3
	Av.	82	44	6.9	5.6	5	77	18	2	1	3